

The Comparison of Serum Ghrelin Concentration in Obese and None Obese Men

Banaeifar Abdolali¹, Mojtaba Eizadi², Shahedi Valiollah³

¹Islamic Azad University, South Tehran branch

²Islamic Azad University, Saveh branch

³Islamic Azad University, Parand branch

Abstract—Background and Aim: Ghrelin, an orexigenic hormone secreted from endocrine cells in the stomach and other tissues, has been shown to stimulate appetite and food intake. Some finding suggested that ghrelin level in obese people is higher than normal weight a person that stimulate appetite and led's to obesity. The purpose of this study was to compare fasting ghrelin concentration between normal and obese men. **Material and methods:** We examined anthropometrical markers and the baseline levels of insulin and the active form of ghrelin in 35 obese ($BMI \geq 30$) and 30 no obese ($20 \leq BMI \leq 25$) men. The data compared with T test ($p > 0.05$). **Results:** There were no significant differences in basal insulin and basal ghrelin between two groups. In addition, ghrelin is not related with insulin resistance in two groups. **Conclusion:** our study demonstrated that the circulation ghrelin in obese men in similar to normal weight men. It is possible that in addition to ghrelin, there are other metabolic variables that affect appetite and food intake in obese men.

Keywords-Ghrelin, Obesity, Insulin, anthropometrical marker

I. INTRODUCTION

Ghrelin, a 28 acid amino- peptide and a novel growth hormone-releasing peptide is known peripheral orexigenic that reliably evokes feeding through a central action involving primarily the neuropeptide Y signaling pathway in

the hypothalamus (1). This peptide hormone is secreted mainly from the stomach and proximal small bowel, and regulates glucose homeostasis and stimulates growth hormone (GH) secretion (2,3), in addition to its effect on energy balance. In healthy people, plasma ghrelin concentration rise before meals and decrease after eating, with changes in plasma levels during meals varying two- to threefold (4). Some finding suggested that ghrelin level is increased in obesity related diseases. In this area, a recent study showed that plasma ghrelin levels were elevated in diabetes (5). These studies suggested that ghrelin is related to insulin resistance in obese people and decrease in ghrelin concentration led to decrease in insulin resistance. Recent epidemiologic studies have demonstrated that the prevalence of asthma and obesity are both increasing concomitantly, suggesting that these factors may be causally related (6).

Due to its role in the regulation of food intake, much of the research on ghrelin relates to obesity. However, ghrelin may also play significant roles in wasting syndromes, such as occurs in patients with COPD. In these states, ghrelin may stimulate food intake while decreasing fat oxidation. In humans, circulating ghrelin levels are decreased in acute states of positive energy balance such as obesity and are increased during fasting and starvation. The hypothesis that ghrelin could play a role in the regulation of glucose homeostasis and insulin secretion was based on the observation that, as shown in the previous sections, several biological activities of AG are mediated by the cholinergic

system/ vagus nerve, which also plays a pivotal role in the regulation of the endocrine pancreas. Ghrelin has gained considerable attention over the last decade for its unique role in regulating mealtime hunger and lipid metabolism, as well as short- and long-term energy homeostasis (7). Some studies stated that ghrelin concentration in obese people. There is conflict findings about difference in ghrelin concentration between obese and none obese people. Therefore in this study, we compared the concentration of ghrelin between obese and none obese males.

II. MATERIAL AND METHODS

Thirty five Healthy volunteers between the ages of 35 and 50 years with a BMI between 29 and 36 kg/m² were recruited in this study. In addition thirty none obese males with a BMI between 20 and 25 kg/m² selected as control group by randomly. Subjects with a history or clinical evidence of impaired fasting glucose or diabetes, recent myocardial infarction, congestive heart failure, active liver or kidney disease, growth hormone deficiency or excess, neuroendocrine tumor, anemia, or who were on medications known to alter insulin sensitivity were excluded. The baseline levels of insulin, glucose and the active form of ghrelin measured in all participants of two groups after 10 - 12 overnight fast. Insulin resistance calculated by using of fasting glucose and insulin. The anthropometrical markers also measured. Multivariable logistic regression was performed to identify relation between ghrelin and other. *P* values smaller than 0.05 were accepted as significant.

III. MATERIAL AND METHODS

The findings of regression analyses show that there is no relation between serum ghrelin and insulin resistance in obese males. In addition, there were no significant differences in basal insulin and basal ghrelin between two

groups. In addition, ghrelin is not related with insulin resistance in two groups.

IV. CONCLUSION

The recent literature suggests that in addition to food intake and energy balance, ghrelin also controls glucose metabolism (8). Furthermore, current evidence suggests that ghrelin could contribute to the metabolic syndrome. It has been shown that ghrelin concentrations are reduced in different pathophysiological conditions including obesity, type 2 diabetic, and other conditions with metabolic disturbances (9). Preclinical studies support a role for ghrelin to regulate glucose metabolism as well as energy balance and GH secretion. The finding of our study demonstrated that serum ghrelin is not difference between obese and none obese males. Also, serum ghrelin is not a suitable predictor of insulin resistance of these peoples.

REFERENCES

- [1] C. Y. Bowers, F. A. Momany, G. A. Reynolds, A. Hong, On the in vitro and in vivo activity of a new synthetic hexapeptide that acts on the pituitary to specifically release growth hormone. *Endocrinology* 1984; 114:1537–1545.
- [2] M. Kojima, H. Hosoda, Y. Date, M. Nakazato, H. Matsuo, K. Kangawa, Ghrelin is a growth-hormone-releasing acylated peptide from stomach. *Nature* 1999; 402:656–660.
- [3] E. Arvat E, V. L. Di, F. Broglio, M. Papotti, G. Muccioli, C. Dieguez, et al. Preliminary evidence that Ghrelin, the natural GH secretagogue (GHS)-receptor ligand, strongly stimulates GH secretion in humans. *J Endocrinol Invest* 2000; 23:493–495.
- [4] F. Broglio, C. Gottero, F. Prodam, et al., “Ghrelin secretion is inhibited by glucose load and insulin-induced hypoglycaemia but unaffected by glucagon and arginine in humans,” *Clinical Endocrinology*, vol. 61, no. 4, pp. 503–509, 2004.
- [5] H. Ariga, K. Imai, C. Chen, C. Mantyh, T. N. Pappas, T. Takahashi, Does ghrelin explain accelerated gastric emptying in the early stages of diabetes mellitus? *Am J Physiol Regul Integr Comp Physiol*. 2008 Jun; 294(6):R1807-12.
- [6] R. J. Hancox, B. J. Milne, R. Poulton, D. R. Taylor, J. M. Greene, Sex differences in the relation between body mass index and asthma and atopy in a birth cohort. *Am J Respir Crit Care Med* 2005;171:440-5.
- [7] T. R. Castaneda, K. Tong, R. Datta, M. Culler, M. H. Tschop, Ghrelin in the regulation of body weight and metabolism. *Front Neuroendocrinol* 2010; 31:44–60.
- [8] S. M. P^oyykk^o, E. Kellokoski, S. H^oorkk^oe, H. Kauma, Y. A. Kes^oaniemi, and O. Ukkola, “Low plasma ghrelin is associated with insulin resistance, hypertension, and the prevalence of type 2 diabetes,” *Diabetes*, vol. 52, no. 10, pp. 2546–2553, 2003.

- [9] R. Barazzoni, M. Zanetti, C. Ferreira, "Relationships between desacylated and acylated ghrelin and insulin sensitivity in the metabolic syndrome," *Journal of Clinical Endocrinology and Metabolism*, vol. 92, pp. 3935–3940, 2007.

Author Index

A		C	
Abbas Sahebghadam	161	C.Satirapipathkul	410,415
Lotfi		Chandramouleeswaran K	249
Abdolhossein Shiravi	310	Chengli Zheng	283
Abdoljalal Marjani	136	Cheng-Tao Wu	271
Abdollah Ghasemi	144,147	Chia-Jung Chang	39
Pirbalouti		Chia-Ming Liu	59
Abdus Salam	360	Chih-Cheng Chen	39,44
Abed Koochpayeh	144	Chin-Dong Chang	39
Abir Ishtiaq	360	Chi-Zon Hong	218
Achintya Saha	231	Congo Tak-Shing Ching	59,63
Adaoha E. C. Ihekwaba	266	Corrado Priami	266
Ahmad Reza Golparvar	147		
Ahmad Reza Shahverdi	364	D	
Ahmadreza Golparvar	144	D Ashok Kumar	470
Akhilesh Pandey	462	D.Rajeswari	106
Albooghobaish N	292	Dae Won Kim	165,170,175,183
Ali Akbar Jamali	425	Daihua Wang	283
Ali Atarodi	222	Dalbir Singh	6
Alireza.Naderi	276	Damien Eveillard	101
Ambayeram	302	Dan-Ling Wang	193
Venkatachalam		Daphne Santhosh	447
Amir M. Rahmani	30	Davood Khorshidi	404
Amna Iqbal	434	Dimitri Perrin	383
Andreas öchsner	123	Dinesh Kumar K.	373,392
Anne Friedrich	93	Dr.M.Sendhilvadiyu	106
Anneh Mohammad	136	DVLN Somayajulu	322
Gharravi			
Aparna V.	458	E	
Archana Sharma	6	E.Rajasekaran	27
Arnab Pramanik	23	Eevera Tamilmani	318
Arpa Wanleeluk	244	Ehsan	222
Arthi Dorai	213	Soleymaninejadian	
Ashok Kumar Balaraman	429	Eizadi Mojtaba	279,407
Azindokht Nezhadi	310	Elham Bidram	161
		Elley HH Chiu	44
B		Eun Jeong Sohn	175
B P S Deepa	249	F	
Bagher Golzarroshan	222	Faraji Gholamreza	279
Banaeifar abdolali	279	Farhad Zaker	136
Bananaeifar Abdolali	440,486	Fateme Esfandiarpour	208
Barkat Ali Khan	434	Fatemeh Noorbakhsh	364
Benjamin.G	35	Fatemeh.Mahdi	276
Bharathwaj.S	35		
Boopathi Subramani	481	G	
Branden Nemecek	296		
Brindha Venkatesh	213		

G. Prowino Madonna Paiva	256	K. JIRAJAROENRAT	299
Gangyi Xu	283	K. MANEEWAN	299
Gautam Sarath	296	K.Akila	27
Gholamreza Dehghan	110	Kalpana S. Joshi	443
Giovanni Montana	114	Kanokwan Sroykesorn	244
Govinda Lenka	481	Karthika Raghavan	383
Guangtang Pan	475	Kavita A. Damle	443
Guillaume Fertin	101	Kazuya Sumikoshi	342
Gyeong Min Yi	305	Kentaro Shimizu	342
		Keun Ho Ryu	305
		Keyvan Molanorouzi	440
H		Koosha Sadeghi	30
Haji M.Shoaib Khan	434	Oskooyee	140
Hamid Mahdavi	161	Kripa S Keyan	318
Haolin Chen	283	Kumaran Shanmugam	327
Heather J. Ruskin	383,419	Kumaran.S	481
Hidayatulfathi Othman	399	Kuo-Yuan Hwa	
Ho Sun Shon	305		
Hong-Sheng Chen	63	L	
Hoon Jae Jeong	165	Lakshmi Tripathi	180
Hsiu-Li Shieh	59,63	Leila Amjad	83,338
Hso-Chi Chaung	39,44,48,218	Liang Wang	71
Hua Peng	475	Lilly M. Saleena	368,373,378
Huang Huaguo	156	Lin-Shien Fu	63
Hussein Doali	404		
		M	
I		M Anburajan	470
Imanipour Vahid	407	M. CHAOWARAT	299
Indah Mohd Amin	151	M. T. Ahmadian	226
Indira Bairy	447	M. Vishnu Priya	256
Irena Rusu	101	M.R.A Kadir	123
Ismail Yusoff	131	Madhavan Soundararajan	296
Izatus Shima Taib	399	Mahsa Shafighi	83
		Mao Luo	475
J		Marija Bezbradica	419
J.C. Nacher	348	Mark Tangney	53
J.Jannet Vennila	27	Martin Crane	419
Jafar Ezzati Nazhad Dolatabadi	110,425	Maryam Alavi	161
Jagadish Singh	429	Masoud Mesgari	222
Jamil Maah	131	Masoud Nasiri Sarvi	226
Jatupat Samappito	203	Matt Silver	114
Jean Muller	93	Md Ataul Islam	231
Jen-Tsung Yang	66	Meena S. Karve	443
Jiang Jinqing	156	Mehdi Ghiafeh Davoodi	353
Jianhuang Wu	88	Mei-Li Wu	44,48
Jinseu Park	165,170,175,183	Menaka.E	327
Joydeep Mukherjee	23	Mi Jin Kim	170
Jui-Fang Chung	66	Minghao Piao	305
		Mohamed Ezzeldin A. Bashir	305
K		Mohammad Ali	110
K. Aishwarya Raghavi	256	Hosseinpour Feizi	

Mohammad Hasanzadeh	425	Rahat Baby	360
Mohammad Jafar Golalipour	136	Raheleh Ghasemzadeh	357
Mohammad M. Riahi Kashani	30	Rajendran Kaliaperumal	318
Mohammad Reza Darabi	310	Rajendran.K	327
Mohammad Sadeghi	253	Raju Bhukya	322
Mohammad. R.	226	Rathi Suganya P.	378
Movahhedy		Reihaneh Ahmadzadeh	353,357
Mohanalakshmi N.	388,458	Ghavidel	
Mohd Rafiz Salji	399	Ria Pal	231
Mojtaba Eizadi	404,486	Rongqiao He	453
Moloud Salehi	208	Roya Narimani	208
Moosa Haideri	222	Roya Sabbagh Novin	208
Muhamad Noor Harun	123	Ru-Ling Jiang	48
Muhammad Aqeel Ashraf Mohd	131	RUNGRATTANAKASI N B.	299
Muhammad Naeem	360		
Mukesh Doble	302	S	
		S.Kriushnapriya	198
N		S.Rajeswari	198
N. Araki	348	Sabari Guru Vasudevan	140
Nasser Razmaraii	425	Sabin Tabirca	53
Natalia B. Kuzmina	76	Saeed Akhtar Rasool	360
Nathanon Trachoo	203,235	Sahba Sadir	123
Naveed Akhtar	434	Sajid Bashir	434
Ngoc-Hoan Nguyen	93	Sajjad Haider Naqvi	453
Nikolay M. Borisov	76	Sandeep Jain	1
Nurdalila A'wani Abd. Aziz	118	Sang-Hoon Baek	71
Nurhayati Bt Mohd Zain	467	Saranya Mohan	256
		Saranyah K.	373
O		Sareh Arjmand	161
Olivier Poch	93	Sarma A. R. P.	368
Om Prakash Sharma	1,6	Jagarlapudi	
Osamu Ohara	462	Sasithorn Kongruang	239,244
		Sassan Rezaie	364
P		Sébastien Angibaud	101
P. Duangsri	415	Seyed Mojtaba Ahmadi	110
Pazhanichamy Kalailingam	318	Seyedhoseini	407
Petchiammal C.	396	Mohammad Ali	
Philippe Bordron	101	Shahedi Valiollah	404,407,440,486
Pi-Jen Tsai	218	Shahrzad Azizi	144
Poonyaporn Borivetanan	331	Shengzhou Luo	88
Prabodh Chander Sharma	1,6	Shibily Prathymnan	140
Pradeepa.M	327	Shinq-Jen Wu	271
Preenon Bagchi	11,15	Show-Mei Chuang	48
		Shugo Nakamura	342
Q		Shu-Mei Chang	481
Qianzhong Li	314	Shu-Mien Hsiao	218
		Shyh-Hwa Liu	39
R		Shyn Joseph	140
		Siti Balkis Budin	399
		Siti Nor Ain Seri Masran	399
		Sohaily Shahram	279,440

Sompid Samipak	331	Vida Hojati	310
Soo Young Choi	165,170,175,183	Vignesh Rajendran	249
Soomi Yang	127	Vishwa Deepak	180
Soon Won Kwon	183	Vo Anh	188,193
Srikanth Govindaraajan	249		
Sudha J. Kulkarni	443	W	
Sudha Sellappa	140	W D Evans	470
Sufeng Han	475	Waheeta Hopper	11,15,388,392,39 6,458
Sujatha Mohan	462	Wang Ziliang	156
Sukesh Kalva	368,378	Wardah Naqvi	453
Sukesh.K.	373	Wei-Hao Liu	59
Sung-Taik Lee	71	Wenguang Liu	180
Suresh Babu Palanisamy	429	Won Sik Eum	165,170,175,183
Suresh Kumar Ramadoss	462		
Syarul Nataqain Baharum	118	X	
		Xianlu Zeng	180
T		Xiao Li	88
T.Leela	410	Xin Ma	88
Tai-Ping Sun	59,63	Xuefeng Gao	53
Takanori Harada	261		
Tapan Kumar Maity	429	Y	
Thanagorn Piachin	235	Yadollah Omid	425
Thanh-Phuong Nguyen	266	Yamini SudhaLakshmi.G	334
Tien-Dao Luu	93	Yan-Fei Wang	188
Tintin Wu	283	Yang Lu	453
Tohru Terada	342	Yoko Ishino	261
Trichur S.	302	Yongchun Zuo	314
Suryanarayanan	44	Yung-Chih Kuo	66
Tsung-Hui Yang			
		Z	
V		Zarinkamar F	292
V Sapthagirivasan	470	Zhang Haitang	156
Vadivelan S.	368	Zhao Kun	156
Vahid.Imanipour	276	Zhiming Zhang	475
Vaiyaburi Thamil Selvan	429	Zhongli Zhang	180
Valiollah Shahedi	276	Zu-Guo Yu	188,193
Venkatchalam Geetha	302		
Venkatesan.P	327		